



SCIENTIFIC DATA SYSTEMS

A sepia-toned photograph showing a close-up of a magnetic tape unit. On the left, a large, circular magnetic tape reel is visible. On the right, a pair of hands is shown operating the unit, with fingers positioned near a smaller component, possibly a capstan or a tape head. The background is dark and out of focus.

SDS Single-Capstan Magnetic Tape Unit

SDS





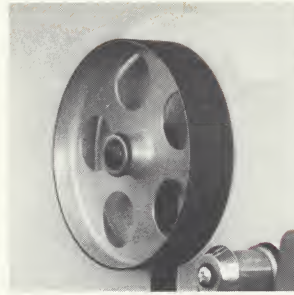
SDS SINGLE-CAPSTAN MAGNETIC TAPE UNIT

Newly developed SDS magnetic tape systems represent a significant advance in the design and technology of digital tape-handling mechanisms. The key element in these systems is a new SDS single-capstan magnetic tape transport unit that includes many features formerly available only in more expensive systems.

Most digital computer systems use one or more magnetic tape units for a variety of purposes including program storage, temporary data storage, and data input and output. In all applications, both the reliability and availability of these units are extremely important. Reliability assures the correct recording of data and the accurate reading of previously recorded information. Availability implies (1) that the transport can operate over long periods without maintenance or adjustment and (2) that maintenance, when required, will be both simple and rapid.

Design characteristics of the new SDS magnetic tape transport guarantee extremely high reliability and the integrity of recorded data for both reading and writing. Other features (1) assure high performance and (2) enhance maintainability and ease of use in a low-cost, IBM-compatible SDS magnetic tape system.

FEATURES



Single-Capstan Drive

A single servo-controlled capstan completely governs tape motion, eliminating the tape wear and dynamic skew associated with pinch roller mechanisms. Complexity associated with the mechanical and pneumatic design of vacuum-capstan drives is eliminated. The drive accelerates the tape uniformly to speeds of 75 or 250 (for rewind) inches per second. This design approach results in mechanism simplicity and controlled start/stop capability.

No Mechanical Adjustments

Because there are no pinch rollers or clamping brakes and because an electronic servo-mechanism controls tape motion, the need for delicate and time-consuming adjustments is completely eliminated. The magnetic tape system user need not spend time adjusting mechanical parts that become worn due to use.



Friction-Free Tape Guides

All tape guides are air bearings. Positive air pressure from within the guide body forms an air cushion, which (1) keeps the oxide from contacting the guiding surfaces and (2) provides a friction-free tape path.

No Oxide Contact With Guiding Elements

The oxide surface of the tape contacts only the read-write head and tape cleaner. Oxide flaking and wear induced by contact with guiding surfaces, vacuum columns, or the tape driving mechanism cannot occur. This feature enhances data reliability and lengthens tape life.

IBM Compatibility

IBM compatibility on the basis of the format of the recorded data, as claimed for most tape units, is only one aspect of SDS compatibility. Equally important: the reference edge of tape guides and the relative location of the read-write head in the SDS tape transport and IBM 729 transport are identical. Tape tracking and skew characteristics of these units are thus compatible, assuring interchangeability of magnetic tape reels among SDS and IBM units. No other tape handler offers this feature.

Vacuum-Column Chambers

Full-length vacuum-column chambers assure a supply of tape to and from the capstan drive: need for a mechanical tape buffer is thus eliminated. The tape is always held at constant tension to minimize dynamic skew and assure proper reel packing. Reel servo design permits use of low-power reel motors, enhancing reliability and reducing cost. An induction-type motor blower is the vacuum source. Because the speed of the

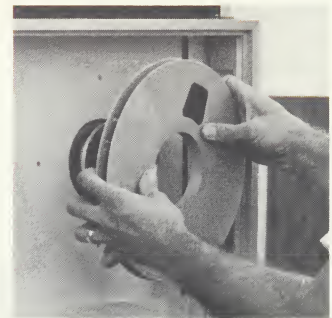


motor is low and because it contains neither brushes nor commutators, its life expectancy is increased. Tape remains in the vacuum columns during the 250 inches per second rewind operation. This permits complete control of tape motion and tension and eliminates mechanical complexities associated with loading and withdrawing the tape from the vacuum columns. The tape is immediately ready for forward motion when the rewind operation stops.

"Push-On, Pull-Off" Reel

POPO*, the push-on, pull-off reel hub assembly, is an SDS innovation for mounting and removing tape reels. A single pushing motion by the operator places the reel on the hub and locks the reel into place. SDS magnetic tape units have neither turn-down knobs nor pressure bars. A single pulling motion by the operator unlocks and removes a reel from the hub. The reels are IBM standard and compatible. No simpler operating hold-down device is available today.

*Trademark, Scientific Data Systems



Operator Convenience

Several features enhance use of this device. To facilitate tape threading, the protective cover over the read-write head opens when the front panel door is lowered, then automatically closes over the tape when the front door is raised. Glass door lowers easily to permit tape loading. Controls are conveniently arranged to permit manual control.

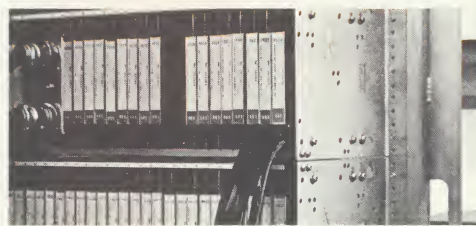


Automatic Loading

Normally found only on much more expensive units, an automatic sequence moves the tape into the vacuum columns and forward to the load point. The operator need not turn the take-up reel many times when threading tape.

Field-Proven SDS Electronics

Silicon semiconductors implement the design of the read-write electronics in SDS magnetic tape systems. The same components have been used successfully in all SDS computers. Because the reliability of this design approach is field-proven, the problems that usually accompany introduction of new, complex electronic devices are obviated.



Fail-Safe Operation

A comprehensive set of interlocks protects the transport and tape against damage caused by failure or accidental misuse of transport manual controls or programmed operation. For example, if the glass door is inadvertently opened, the unit stops operating immediately.

Attractive Cabinet Design

Clean, modern lines characterize the design of the cabinet that houses the new SDS tape transport. The tinted glass front door helps make this unit an attractive addition to any computer installation.

"automatic" (computer-controlled) mode if no transport interlocks are open.

▪ **Ready**

Indicator that lights when transport is in automatic mode and can accept a computer command.

▪ **Rewind**

Momentary switch that causes the tape to rewind to the load point if in the manual mode. The switch is lighted during the rewind operation. Pressing this switch when the tape unit is at the load point causes the transport to unload.

▪ **Load**

Momentary switch that causes an automatic tape loading sequence. The tape is drawn into the vacuum columns and then advanced to the load point. The load button becomes inactive once the tape has reached the load point and all interlocks have been closed. The load indicator is lighted during the load sequence.

▪ **Load Point**

Indicator that is lighted when the tape is stopped on the beginning-of-tape reflective marker.

▪ **Manual Reset**

Momentary contact switch that restores the unit to the manual mode. If the tape is in motion, it is stopped in a controlled fashion, bringing the unit to an orderly halt.

An auxiliary panel contains motion control switches to facilitate maintenance. Controls for forward, fast forward, reverse, and fast reverse are provided. The fast speed is 250 inches per second.

GENERAL SPECIFICATIONS

The following general specifications apply to the SDS magnetic tape systems that use the new SDS tape transport unit:

Operating Characteristics

Tape Speed	75 in./sec
Start/Stop Time	5 msec

Rewind Time	2 min for 2400 ft of tape
Recording Format	Seven-channel, NRZ, ¼-inch interrecord gap (IBM 729 Series compatible)
Program Restrictions	None

Tape Characteristics

Packing Density	200/556/800 bits/in.
Width	½ in.
Type	1.5-mil base Mylar®*
Reel Hubs	SDS POPO standard on file (supply) reel. Accommodates IBM-type 10½-inch reels
Extremity Sensing	Photoelectric sensing of both beginning and end of tape
Electronics	Solid-state. Exclusive use of silicon semiconductors

Environmental Conditions

Operating Temperature	50°F to 90°F
Relative Humidity	5% to 80%
Power Requirements	117v ac ±10%, 60 cycle, single phase

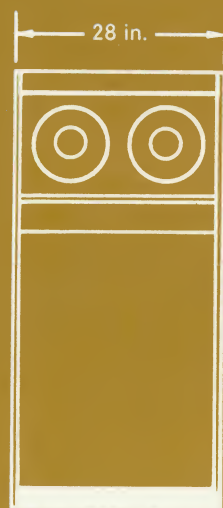
Physical Dimensions

Height	63½ in.
Width	28 in.
Depth	28 in.
Weight	
Including cabinet	780 lb
With data electronics	815 lb
With data electronics and system controller	850 lb

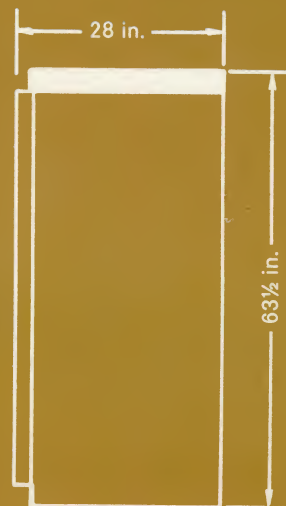
The following SDS magnetic tape systems use the new SDS magnetic tape unit. The SDS tape transports include appropriate data electronics.

Transport Model	Controller Type	Characteristics
95461	Dual Density	200 bpi, 15,000 char/sec 556 bpi, 41,700 char/sec
95462	Triple Density	200 bpi, 15,000 char/sec 556 bpi, 41,700 char/sec 800 bpi, 60,000 char/sec

*Mylar is a registered trademark of E. I. du Pont de Nemours & Co.



Front View



Side View

SDS Magnetic Tape Unit Physical Layout

HOW SDS AND COMPETITIVE TRIPLE-DENSITY MAGNETIC TAPE SYSTEMS COMPARE

Feature	SDS 95462	IBM 729V	CDC 604	DEC 570	CCC
Tape Motion System	Single capstan	Dual pinch rollers	Dual vacuum capstans	Dual noncontacting pressure system	No triple-density tape systems available
Oxide Contact Points	Read-write head and tape cleaner only	Many plus inside of vacuum columns	Several	Many plus inside of vacuum columns	
Mechanical Adjustments	None	Many	Many	Several	
Friction-Free Tape Path	Yes	No	No	No	
Full-Length Vacuum Columns	Yes	Yes	Yes	Yes	
In-Column Rewind	Yes	No	Yes	No	
IBM Identical Guide Path	Yes	Yes	No	No	
Automatic Tape Loading	Yes	Yes	Yes	Yes	
Hub Mounting	SDS POPO	Pressure bar	Turn down	Turn down	
Tape Speed	75 ips	75 ips	75 ips	75 ips	
Maximum Transfer Rate	60 kc	60 kc	60 kc	60 kc	



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or subject matter checked below:

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 - ☐ SDS 92
 - ☐ SDS 910
 - ☐ SDS 920
 - ☐ SDS 925
 - ☐ SDS 930
 - ☐ SDS 9300
- ☐ Hybrid Computers
- ☐ Computer-Controlled Systems
- ☐ Programming Systems
- ☐ A/D Systems Components
 - ☐ A-to-D Converters
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